That Which is Claimed is:

1. A method of utilizing a divided storage vessel comprising the steps of:

transferring a first liquid densified gas based treating solution from a first liquid chamber in a divided storage vessel having a plurality of liquid chambers that share a common vapor space to a processing vessel;

returning the first treating solution from the processing vessel to the divided storage vessel;

transferring a second liquid densified gas based treating solution having a composition different from the first treating solution from a second liquid chamber in the divided storage vessel to a processing vessel; and

returning the second treating solution from the processing vessel to the divided storage vessel.

2. The method according to Claim 1, further comprising the step of storing a plurality of densified gas based treating solutions present as two-phase systems in a divided storage vessel having a plurality of liquid chambers that share a common vapor space.

3. The method according to Claim 1, wherein the step of transferring a first liquid densified gas based treating solution from a first liquid chamber in a divided storage vessel to a processing vessel comprises heating and/or pressurizing the first liquid densified gas based treating solution to provide a first supercritical fluid based treating solution; and wherein the step of returning the first treating solution from the processing vessel to the divided storage vessel comprises depressurizing and/or cooling the first supercritical fluid based treating solution to provide a first liquid densified gas based treating solution.

4. The method according to Claim 1, further comprising the steps of:

pressurizing and/or heating the first liquid densified gas based treating solution in the processing vessel to provide a first supercritical fluid based treating solution; and

depressurizing and/or cooling the first supercritical fluid based treating solution in the processing vessel to provide a first liquid densified gas based treating solution.

5. The method according to Claim 1, further comprising the step of pressurizing and/or heating the first liquid densified gas based treating solution in the processing vessel to provide a first supercritical fluid based treating solution; and wherein the step of returning the first treating solution from the processing vessel to the divided storage vessel comprises depressurizing and/or cooling the first supercritical fluid based treating solution to provide a first liquid densified gas based treating solution.

6. The method according to Claim 1, wherein the step of transferring a first liquid densified gas based treating solution from a first liquid chamber in a divided storage vessel to a processing vessel comprises heating and/or pressurizing the first liquid densified gas based treating solution to provide a first supercritical fluid based treating solution, said method further comprising the step of depressurizing and/or cooling the first supercritical fluid based treating solution in the processing vessel to provide a first liquid densified gas based treating solution.

7. The method according to Claim 1, wherein the first densified gas based treating solution is a first carbon dioxide based treating solution, and the second densified gas based treating solution is a second carbon dioxide based treating solution.

8. The method according to Claim 7, further comprising the steps of:

contacting an article in the processing vessel with the first treating solution; and

contacting the article in the processing vessel with the second treating solution.

9. The method according to Claim 8, wherein the article is a fiber optic device or component.

10. The method according to Claim 9, wherein the step of contacting the article in the processing vessel with the first treating solution comprises cleaning the fiber optic device or component using the first treating solution.

11. The method according to Claim 10, wherein the step of contacting the article in the processing vessel with the second treating solution comprises coating the fiber optic device or component with a coating using the second treating solution.

12. The method according to Claim 11, wherein the coating is a polymer coating.

13. The method according to Claim 9, wherein the step of contacting the article in the processing vessel with the first treating solution comprises coating the fiber optic device or component with a first coating using the first treating solution; and wherein the step of contacting an article in the processing vessel with the second treating solution comprises coating the fiber optic device or component with a second coating using the second treating solution, said second coating having a different composition from said first coating.

14. The method according to Claim 8, wherein at least one of the first or second treating solutions is an impregnating solution, and wherein the step of contacting the article with the impregnating solution comprises the step of impregnating the article with an impregnating agent.

15. The method according to Claim 14, wherein the article is a foodstuff.

16. The method according to Claim 14, wherein the impregnating agent comprises a pharmaceutical compound.

17. The method according to Claim 8, wherein at least one of the first or the second treating solutions is an extracting solution, and wherein the step of contacting the article with the extracting solution comprises the step of extracting a substance from a substrate using the extracting solution.

18. The method according to Claim 17, wherein the article is selected from the group consisting of plants and seeds.

19. The method according to Claim 18, wherein the substance extracted from the article is selected from the group consisting of flavors, vitamins, natural product drugs, and drug precursors.

20. The method according to Claim 8, wherein at least one of the first or the second treating solutions is a developing solution, and wherein the step of contacting the article with the developing solution comprises the step of developing a resist on a semiconductor substrate using the developing solution.

21. The method according to Claim 7, wherein the first treating solution is a first reacting solution comprising a first reactant, wherein the second treating solution is a second reacting solution comprising a second reactant, and the method further comprises the step of synthesizing a chemical compound by combining the first reacting solution with the second reacting solution.

22. The method according to Claim 7, further comprising the step of combining the first treating solution with the second treating solution in the processing vessel, wherein the first treating solution further comprises one or more monomers, and wherein the second treating solution further comprises an initiator, such that said combining step polymerizes the one or more monomers.

23. The method according to Claim 22, wherein the step of transferring the second treating solution from the second liquid chamber to the processing vessel precedes or is concurrent with the step of transferring the first treating solution from the first liquid chamber to the processing vessel, and wherein the step of transferring the first treating solution from the first liquid chamber to the processing vessel comprises the step of metering the first treating solution into the processing vessel to control one or more properties of a polymer formed in the polymerizing step.

24. The method according to Claim 7, further comprising the step of combining the first treating solution comprising a chemical compound with a third

treating solution substantially devoid of liquid carbon dioxide to purify the chemical compound.

25. The method according to Claim 7, wherein the processing system is a batch processing system.

26. The method according to Claim 7, wherein the processing system is a semi-batch processing system.

27. The method according to Claim 7, wherein the processing system is a continuous processing system.

28. The method according to Claim 7, wherein the first treating solution comprises greater than 75% by volume liquid carbon dioxide, and wherein the second treating solution comprises greater than 75% by volume liquid carbon dioxide.

29. A dry cleaning method comprising the steps of:

transferring a first densified gas based dry-cleaning solution from a first liquid chamber of the divided working tank to a wash tank containing a dry-cleanable article;

contacting the dry-cleanable article with the first dry-cleaning solution;

returning the first dry-cleaning solution from the wash tank to the divided working tank;

transferring a second carbon densified gas based dry-cleaning solution from a second liquid chamber of the divided working tank to the wash tank;

contacting the dry-cleanable article with the second dry-cleaning solution; and

returning the second dry-cleaning solution from the wash tank to the divided working tank.

30. The method according to Claim 29, further comprising the step of storing a plurality of densified gas based dry-cleaning solutions present as two-phase systems in a divided storage vessel having a plurality of liquid chambers that share a common vapor space.

31. The method according to Claim 29, wherein the first densified gas based dry-cleaning solution is a first carbon dioxide based dry-cleaning solution and the second densified gas based dry-cleaning solution is a second carbon dioxide based dry-cleaning solution.

32. The method according to Claim 31, wherein the first densified gas based dry-cleaning solution is selected from the group consisting of a pre-wash solution, a wash solution, and a coating solution, and wherein the second densified gas based dry-cleaning solution is selected from the group consisting of a wash solution, a coating solution, and a rinse solution.

33. The method according to Claim 31, wherein the step of returning the first carbon dioxide based dry-cleaning solution from the wash tank to the divided working tank comprises the step of returning the first carbon dioxide based dry-cleaning solution from the wash tank to the first chamber of the divided working tank.

34. The method according to Claim 31, wherein the step of returning the second carbon dioxide based dry cleaning solution from the wash tank to the divided working tank comprises the step of returning the second carbon dioxide based dry cleaning solution from the wash tank to the second chamber of the divided working tank.

35. The method according to Claim 34, further comprising the step of distilling the second carbon dioxide based dry cleaning solution in the second liquid chamber to form still bottoms and vapor consisting essentially of carbon dioxide.

36. The method according to Claim 31, further comprising the step of transferring a first volume of the first carbon dioxide based dry cleaning solution from the first liquid chamber to a third liquid chamber of the divided working tank, wherein the step of transferring the first volume from the first liquid chamber into a third liquid chamber precedes the step of transferring a first carbon dioxide based dry cleaning solution from the first liquid chamber to the wash tank.

37. The method according to Claim 36, wherein the step of transferring a first volume comprises equilibrating the liquid levels in the first liquid chamber and the third liquid chamber.

38. The method according to Claim 36, further comprising the step of transferring a second volume of the first carbon dioxide based dry-cleaning solution from the third liquid chamber into the first liquid chamber after transferring a first carbon dioxide based dry-cleaning solution from the first liquid chamber to the wash tank, such that a third volume of the first carbon dioxide based dry-cleaning solution remains in the third liquid chamber.

39. The method according to Claim 38, wherein the step of transferring a second volume comprises equilibrating the liquid levels in the first liquid chamber and the third liquid chamber.

40. The method according to Claim 38, further comprising the step of transferring the second volume of the first carbon dioxide based dry-cleaning solution from the first liquid chamber to the wash tank.

41. The method according to Claim 40, further comprising the step of distilling the third volume of the first carbon dioxide based dry-cleaning solution in the third liquid chamber.

42. The method according to Claim 41, wherein the distilling step comprises the steps of:

boiling the third volume of the first carbon dioxide based dry-cleaning solution in the third liquid chamber to form still bottoms and vapor, the vapor consisting essentially of carbon dioxide;

condensing the vapor from the third liquid chamber to form a liquid consisting essentially of liquid carbon dioxide;

collecting the liquid carbon dioxide in the second liquid chamber; and

purging the still bottoms from the third liquid chamber.

43. The method according to Claim 42, wherein the step of returning the first carbon dioxide based dry-cleaning solution from the wash tank to the divided working tank comprises the step of returning the first carbon dioxide based dry-cleaning solution from the wash tank to the first liquid chamber.

44. The method according to Claim 43, wherein the step of returning the second carbon dioxide based dry-cleaning solution from the wash tank to the divided working tank comprises the step of returning the second carbon dioxide based dry-cleaning solution from the wash tank to the first liquid chamber.

45. The method according to Claim 43, wherein the step of returning the second carbon dioxide based dry-cleaning solution from the wash tank to the divided working tank comprises the step of returning the second carbon dioxide based dry-cleaning solution from the wash tank to the third liquid chamber, the method further comprising the steps of:

adding a coating adjunct to the second carbon dioxide based dry-cleaning solution during or after the step of transferring the second carbon dioxide based dry-cleaning solution from the second liquid chamber to the wash tank; and

distilling the second carbon dioxide based dry-cleaning solution in the third chamber.

46. The method according to Claim 36, further comprising the step of transferring the first volume of the first carbon dioxide based dry-cleaning solution from the third liquid chamber to the wash tank before transferring a first carbon dioxide based dry-cleaning solution from the first liquid chamber to the wash tank.

47. The method according to Claim 46, further comprising the step of adding a pre-wash adjunct to the first volume of the first carbon dioxide based dry-cleaning solution.

48. The method according to Claim 46, further comprising the steps of:

contacting the article with the first volume of the first carbon dioxide based dry-cleaning solution; and

returning the first volume of the first carbon dioxide based dry-cleaning solution from the wash tank to the third liquid chamber of the divided working tank before transferring a first carbon dioxide based dry-cleaning solution from the first liquid chamber to the wash tank.

49. The method according to Claim 48, further comprising the step of distilling the first volume of the first carbon dioxide based dry-cleaning solution in the third liquid chamber after returning the first volume of the first carbon dioxide based dry-cleaning solution from the wash tank to the third liquid chamber.

50. The method according to Claim 49, wherein the distilling step occurs during at least one of the steps of transferring a first carbon dioxide based dry-cleaning solution from the first liquid chamber to the wash tank, contacting the article in the wash tank with the first carbon dioxide based dry-cleaning solution, returning the first carbon dioxide based dry-cleaning solution from the wash tank to the divided working tank, transferring a second carbon dioxide based dry-cleaning solution from the second liquid chamber to the wash tank, contacting the article in the wash tank with the second carbon dioxide based dry-cleaning solution, or returning the second carbon dioxide based dry-cleaning solution from the wash tank to the divided working tank.

51. The method according to Claim 50, wherein the step of returning the second carbon dioxide based dry-cleaning solution from the wash tank to the divided working tank comprises the step of returning the second carbon dioxide based dry-cleaning solution from the wash tank to the first liquid chamber.

52. A cleaning method comprising the steps of:

transferring a first densified gas based treating solution from a first liquid chamber of a divided working tank having a plurality of liquid chambers that share a common vapor space to a wash tank containing an article;

contacting the article with the first treating solution;

returning the first treating solution from the wash tank to the divided working tank;

transferring a second carbon densified gas based treating solution from a second liquid chamber of the divided working tank to the wash tank;

contacting the article with the second treating solution; and

returning the second treating solution from the wash tank to the divided working tank.

53. The method according to Claim 52, further comprising the step of storing a plurality of densified gas based treating solutions present as two-phase systems in a divided working tank having a plurality of liquid chambers that share a common vapor space.

54. The method according to Claim 52, wherein the method is a dry cleaning method and wherein the article is a garment.

55. The method according to Claim 52, wherein the article is a hard substrate.

56. The method according to Claim 55, wherein the hard substrate is a microelectronic device.

57. A dry cleaning system employing a carbon dioxide based solvent, said system comprising:

a divided working tank configured to store a plurality of liquid carbon dioxide based treating solutions having different compositions, said divided working tank including:

an exterior wall defining an interior volume, said exterior wall capable of withstanding an internal pressure of at least about 500 psig; and

a first dividing member extending from an interior surface of the exterior wall and defining a first and a second liquid chamber in the divided pressure vessel, wherein the first and the second liquid chambers share a common vapor space;

a first carbon dioxide based dry-cleaning solution consisting essentially of liquid carbon dioxide positioned in the first liquid chamber; and

a wash tank configured to contact a dry-cleanable article to be cleaned with one or more of the plurality of treating solutions, the wash tank in fluid communication with the divided working tank.

58. The system according to Claim 57, wherein the working tank further includes a second dividing member defining a third liquid chamber, the third liquid chamber sharing the common vapor space with the first and the second liquid chambers.

59. The system according to Claim 58, wherein the second liquid chamber is positioned between the first liquid chamber and the third liquid chamber.

60. The system according to Claim 59, further comprising a single operating level sensor positioned within the divided working tank, wherein the single level sensor is positioned within the second liquid chamber, and wherein the level sensor is capable of sensing the level of carbon dioxide based dry-cleaning solution in the second liquid chamber.

61. The system according to Claim 59, further comprising a heating element operatively associated with the third liquid chamber.

62. The system according to Claim 61, further comprising:

a liquid transfer system providing liquid communication between the divided working tank and the wash tank; and

a vapor transfer system providing vapor communication between the divided working tank and the wash tank.

63. The system according to Claim 62, further comprising:

a first opening in the exterior wall adjacent the first liquid chamber for liquid transfer between the first liquid chamber and an environment external to the divided working tank;

a second opening in the exterior wall adjacent the second liquid chamber for liquid transfer between the second liquid chamber and the environment external to the divided working tank;

a third opening in the exterior wall adjacent the third liquid chamber for liquid transfer between the third liquid chamber and the environment external to the divided working tank; and

a fourth opening in the exterior wall adjacent the common vapor space for fluid transfer between the common vapor space and the environment external to the divided working tank;

wherein the first, the second, and the third openings are in liquid communication with the liquid transfer system, and wherein the fourth opening is in fluid communication with the vapor transfer system.

64. The system according to Claim 63, further comprising a condenser positioned in the vapor transfer system, wherein the condenser is in fluid communication with the fourth opening of the exterior wall of the divided working tank, and wherein the fourth opening in the exterior wall is positioned above the first liquid chamber.

65. The system according to Claim 58, further comprising:

a second carbon dioxide based dry-cleaning solution positioned within the second liquid chamber, the second dry-cleaning solution having a second composition and;

a third carbon dioxide based dry-cleaning solution positioned within the third liquid chamber, the third dry-cleaning solution having a second composition, wherein the first, the second, and the third compositions are different.

66. A divided pressure vessel for use in a carbon dioxide based system, said pressure vessel comprising:

an exterior wall defining an interior volume, said exterior wall capable of withstanding an internal pressure of at least about 500 psig;

a first dividing member extending from an interior surface of the exterior wall and defining a first and a second liquid chamber in the divided pressure vessel, wherein the first and the second liquid chambers share a common vapor space; and

a first carbon dioxide based treating solution consisting essentially of liquid carbon dioxide positioned in the first liquid chamber.

67. The pressure vessel according to Claim 66, further comprising a single operating level sensor positioned within the divided pressure vessel, wherein the single level sensor is positioned within the first liquid chamber, and wherein the single level sensor is capable of sensing the level of carbon dioxide based treating solution in the first liquid chamber.

68. The pressure vessel according to Claim 66, further comprising a second carbon dioxide based treating solution having a second composition positioned in the second liquid chamber, wherein the compositions of the first and the second treating solutions are different.

69. The pressure vessel according to Claim 66, further comprising a second dividing member defining a third liquid chamber, the third liquid chamber sharing the common vapor space with the first and the second liquid chambers.

70. The pressure vessel according to Claim 69, wherein the second liquid chamber is positioned between the first liquid chamber and the third liquid chamber.

71. The pressure vessel according to Claim 70, further comprising a heating element operatively associated with the third liquid chamber.

72. The pressure vessel according to Claim 71, further comprising:

a first opening in the exterior wall adjacent the first liquid chamber for liquid transfer between the first liquid chamber and an environment external to the divided working tank;

a second opening in the exterior wall adjacent the second liquid chamber for liquid transfer between the second liquid chamber and the environment external to the divided working tank; and

a third opening in the exterior wall adjacent the third liquid chamber for liquid transfer between the third liquid chamber and the environment external to the divided working tank.

73. The pressure vessel according to Claim 72, further comprising a fourth opening in the exterior wall adjacent the common vapor space for fluid transfer between the common vapor space and the environment external to the divided working tank.

74. The pressure vessel according to Claim 73, wherein the fourth opening in the exterior wall is positioned above the first liquid chamber.

75. A method of utilizing a divided storage vessel comprising the steps of:

transferring a first treating adjunct from a first chamber in a divided storage vessel having a plurality of chambers that share a common vapor space to a processing vessel;

transferring a densified fluid comprising a liquid densified gas or a supercritical fluid into the processing vessel;

removing the first treating adjunct from the processing vessel;

transferring a second treating adjunct having a composition different from the first treating adjunct from a second chamber in the divided storage vessel to the processing vessel; and

removing the second treating adjunct from the processing vessel.

76. The method according to Claim 75, wherein the step of removing the first treating adjunct from the processing vessel comprises removing the first treating

adjunct and the densified fluid from the processing vessel.

77. The method according to Claim 76, further comprising the step of transferring a densified fluid into the processing vessel after the step of transferring a second treating adjunct from the second chamber in the divided storage vessel to the processing vessel.

78. The method according to Claim 75, wherein the densified fluid is liquid carbon dioxide.

79. The method according to Claim 75, wherein the densified fluid is supercritical carbon dioxide.

80. The method according to Claim 75, wherein the steps of transferring a first treating adjunct from a first chamber in a divided storage vessel to a processing vessel, and transferring a densified fluid into the processing vessel occur concurrently.

81. The method according to Claim 80, wherein the densified fluid is a liquid densified gas, wherein the first treating adjunct and the densified fluid are components of a first treating solution in the first chamber of the divided storage vessel, and wherein the steps of transferring a first treating adjunct from a first chamber in a divided storage vessel to a processing vessel, and transferring a densified fluid into the processing vessel comprise the step of transferring the first treating solution from the first chamber of the divided storage vessel to the processing vessel.

82. The method according to Claim 75, wherein the step of transferring a first treating adjunct from a first chamber in a divided storage vessel to a processing vessel occurs after the step of transferring a densified fluid into the processing vessel.

83. The method according to Claim 75, wherein the step of transferring a first treating adjunct from a first chamber in the divided storage vessel to a processing vessel comprises:

pressurizing the divided storage vessel to a pressure higher than the pressure

of the processing vessel; and

establishing fluid communication between the first chamber in the divided storage vessel and the processing vessel.

84. The method according to Claim 83, wherein the step of pressurizing the divided storage vessel to a pressure higher than the pressure of the processing vessel comprises charging a non-carbon dioxide gas into the divided storage vessel.

85. The method according to Claim 83, wherein the step of pressurizing the divided storage vessel to a pressure higher than the pressure of the processing vessel comprises charging carbon dioxide into the divided storage vessel.

86. The method according to Claim 75, wherein at least one of the first and the second treating adjuncts is an etching adjunct, and a mixture formed by the etching adjunct and the densified fluid is capable of etching a semiconductor substrate.

87. The method according to Claim 75, wherein at least one of the first and the second treating adjuncts is a developing adjunct, where a mixture formed by the developing adjunct and the densified fluid is capable of developing a photoresist coating on a semiconductor substrate.

88. The method according to Claim 75, wherein at least one of the first and the second treating adjuncts is a chemical mechanical planarization (CMP) slurry adjunct, where a mixture formed by the CMP slurry adjunct and the densified fluid is capable of planarizing the surface of a semiconductor substrate.

89. The method according to Claim 88, wherein the first treating adjunct is a CMP slurry, and wherein the second treating adjunct is a CMP cleaning adjunct, where a mixture formed by the CMP cleaning adjunct and the densified fluid is capable of removing post-CMP residues from a semiconductor substrate.

90. The method according to Claim 75, wherein at least one of the first and the second treating adjuncts is a photoresist removal adjunct, where a mixture formed

by the photoresist removal adjunct and the densified fluid is capable of removing a photoresist coating from a semiconductor substrate.

91. A method of utilizing a divided storage vessel comprising the steps of:

charging a first densified fluid comprising a liquid densified gas or a supercritical fluid into a processing vessel;

removing the first densified fluid from the processing vessel;

charging the first densified fluid into a first liquid chamber in a divided storage vessel having a plurality of liquid chambers that share a common vapor space;

charging a second densified fluid comprising a liquid densified gas or a supercritical fluid into the processing vessel;

removing the second densified fluid from the processing vessel; and

charging the second densified fluid into a second liquid chamber in the divided storage vessel.

92. The method according to Claim 91, wherein when the first treating solution is a supercritical fluid based treating solution, the method further comprises changing the state of the first treating solution from supercritical fluid to densified gas prior to charging the first treating solution into the first liquid chamber of the divided storage vessel.

93. The method according to Claim 91, wherein when the second treating solution is a supercritical fluid based treating solution, the method further comprises changing the state of the second treating solution from supercritical fluid to densified gas prior charging the second treating solution into the second liquid chamber of the divided storage vessel

94. The method according to Claim 91, wherein the first densified fluid comprises carbon dioxide, and the second densified fluid comprises carbon dioxide.

95. The method according to Claim 91, further comprising the step of purifying at least one of the first densified fluid and the second densified fluid to provide substantially pure gas or densified fluid after removing the first and/or the second densified fluids to the divided storage vessel.

96. The method according to Claim 95, wherein the purifying step comprises the steps of:

transferring at least one of the first densified fluid and the second densified fluid from the divided storage vessel to a purification system; and

purifying at least one of the first densified fluid and the second densified fluid to provide substantially pure gas or densified fluid.

97. The method according to Claim 91, wherein at least one of the first and the second densified fluids is an etching solution capable of etching a semiconductor substrate, or wherein at least one of the first and the second densified fluids is mixed with an etching adjunct to provide an etching solution capable of etching a semiconductor substrate.

98. The method according to Claim 91, wherein at least one of the first and the second densified fluids is a developing solution capable of developing a photoresist coating on a semiconductor substrate, or wherein at least one of the first and the second densified fluids is mixed with a developing adjunct to provide a developing solution capable of developing a photoresist coating on a semiconductor substrate.

99. The method according to Claim 91, wherein at least one of the first and the second densified fluids is a chemical mechanical planarization (CMP) slurry capable of planarizing the surface of a semiconductor substrate, or wherein at least one of the first and the second densified fluids is mixed with a CMP slurry adjunct to provide a CMP slurry capable of planarizing the surface of a semiconductor substrate.

100. The method according to Claim 99, wherein the first densified fluid is a CMP slurry, and wherein the second densified fluid is a CMP cleaning solution capable of removing post-CMP residues from a semiconductor substrate.

101. The method according to Claim 91, wherein at least one of the first and the second densified fluids is a photoresist removal solution capable of removing a photoresist coating from a semiconductor substrate, or wherein at least one of the first

and the second densified fluids is mixed with a photoresist removal adjunct to provide a photoresist removal solution capable of removing a photoresist coating from a semiconductor substrate.